

**FLUID INJECTION APPARATUS WITH  
IMPROVED CONTRAST VISUALIZATION**

**ABSTRACT OF THE DISCLOSURE**

5 An apparatus and method for manually injecting fluid into a patient with improved contrast visualization are disclosed. The apparatus includes a syringe having a cylinder in which a plunger is reciprocatingly mounted. The syringe is connected to a manifold which itself is connected to a source of  
10 radiopaque contrast. Retraction of the plunger within the cylinder draws contrast into the cylinder, and depression of the plunger forces the contrast through the manifold and into a patient through a catheter. In order to increase the speed of injection and thus the visualization of the contrast, an improved visualization device is provided which may be provided in the form  
15 of a heater or, alternatively, in the form of an expandible catheter. The heater may be positioned anywhere within the apparatus to elevate the temperature of the contrast material, which in turn reduces its viscosity and thereby increases the speed with which fluid may be injected. The expandible catheter, may be used to restrict blood flow through a vascular structure so  
20 that the contrast material may be injected into the patient with lessened resistance and dilution from blood flow.

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